

A parrot of the Caribbean? A remarkable find from a 17th-century Spanish shipwreck

Joanne H. Cooper & Philip L. Armitage

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SUMMARY.—Two small bird bones retrieved from a 17th-century shipwreck off the Florida Keys are identifiable as those of a small parrot, referred to *Aratinga* / *Pionus*. The shipwreck is one of the small merchant vessels of the Spanish Tierra Firme fleet lost in a hurricane in 1622, homeward bound after loading cargo in Spanish colonial ports around the northern South American coast and Caribbean. The remarkable discovery of parrot remains provides unique evidence of a probably thriving 17th-century transatlantic trade in small parrots from the New World, for which, despite appearing in contemporary art and literature, no archaeological record appears to exist in Europe.

In 1989, a suspected 17th-century shipwreck was discovered at a depth of 400 m off the Dry Tortugas islands in the Florida Keys. Subsequent excavation of the wreck in 1990–91 by G. Stemm and J. Morris of Seahawk Deep Ocean Technology pioneered the use of a remotely operated vehicle fitted with a sediment removal and filtration system, making it the first shipwreck to be excavated scientifically by a robot. Some 16,900 artefacts were recovered from the wreck, including gold and silver mined in the New World and pearls, leading to the identification of the ship as one of the vessels of the homeward-bound Spanish Tierra Firme treasure fleet of 1622, several of which foundered one day out of Cuba in a hurricane off the Florida Keys (Stemm *et al.* 2012). An assemblage of 165 animal bones was also recovered. Re-examination of these bones in 2011 identified remains of pig, sheep, cattle and chickens consumed onboard. However, considerably smaller faunal remains were also successfully retrieved, including Black Rat *Rattus rattus* and domestic cat *Felis catus* (Armitage 2012). Most remarkable of all, given the location of the wreck and the nature of its excavation, was the discovery of two bones belonging to a small parrot. We report here on the identification of these finds and their significance as evidence of 17th-century trade in New World parrots.

Material and Methods

TOR-90-00216-BN is a largely intact left femur, with some damage to its articular surfaces, most notably the trochanter is damaged and, distally, the external condyle is largely absent.

TOR-90-00170-BN is a left tarsometatarsus, also with damage to its articular surfaces. Notably, the hypotarsus and much of the trochleae are missing.

The femur was compared to a range of small and medium-sized South American, Caribbean and Afrotropical parrot taxa held in the avian osteological collection of the Natural History Museum, Tring (Table 1). Measurements were taken with calipers accurate to 0.1 mm. Osteological terminology follows Howard (1929). Only photographs were available for comparison of the tarsometatarsus with specimens.

Both specimens are now deposited in the collections of Odyssey Marine Exploration Inc., Tampa, Florida (USA).

TABLE 1

Comparative measurements of Tortugas wreck specimens with a selection of key species. Note that the shipwreck specimens' greatest length, proximal width and distal width are surviving dimensions—they are reduced by damage, albeit only slightly. All measurements in mm.

Taxon/specimen	Greatest length min.–max. mean	Proximal width min.–max. mean	Distal width min.–max. mean	Minimum shaft width min.–max. mean
Femur				
Tortugas wreck TOR-90-00216-BN	38.35	6.9	6.4	2.9
<i>Pionus menstruus</i> (<i>n</i> = 3)	36.5–38.2 37.4	7.1 7.1	7.1–7.4 7.3	2.9–3.0 2.9
<i>Aratinga wagleri</i> (<i>n</i> = 4)	36.0–38.0 37.25	7.1–7.8 7.49	6.95–7.4 7.14	2.8–3.1 2.98
<i>A. holochlora</i> (<i>n</i> = 2)	32.5–34.0 33.25	6.5–7.0 6.75	6.3–6.5 6.4	2.8 2.8
<i>A. solstitialis</i> (<i>n</i> = 2)	26.6–27.8 27.2	5.6 5.6	5.4 5.1	2.4 2.4
<i>Diopsittaca nobilis</i> (<i>n</i> = 4)	30.7–34.4 32.05	6.4–7.3 6.675	5.8–6.9 6.25	2.7–3.1 2.85
Tarsometatarsus				
Tortugas wreck TOR-90-00170-BN	17.3	7.0	8.8	4.0
<i>Pionus menstruus</i> (<i>n</i> = 2)	17.2 17.2	7.6–7.7 7.65	8.9–9.4 9.15	4.1 4.1
<i>Aratinga wagleri</i> (<i>n</i> = 4)	18.7–19.7 19.2	7.1–7.4 7.23	8.1–8.7 8.48	3.5–3.6 3.55
<i>A. holochlora</i> (<i>n</i> = 2)	16.5–18.1 17.3	6.2–6.5 6.35	7.8–8.0 7.9	3.0–3.1 3.05
<i>A. solstitialis</i> (<i>n</i> = 2)	14.6 14.6	5.1–5.4 5.25	6.5–6.7 6.6	2.8–2.9 2.85
<i>Diopsittaca nobilis</i> (<i>n</i> = 4)	15.8–17.7 16.35	5.9–6.8 6.225	7.1–8.0 7.4	3.3–3.8 3.5

Specimens examined:

Pionus menstruus BMNH 1896.6.9.2; 1925.1.27.1; 1996.57.1

Aratinga wagleri BMNH S/2002.4.1; S/2002.4.5; S/2006.51.2; S/2006.56.2

A. holochlora BMNH S/1991.1.32; S/1991.44.10

A. solstitialis BMNH S/1983.5.2; S/1989.29.2

Diopsittaca nobilis BMNH 1903.12.20.239; S/1989.27.6; S/1989.27.7; S/1992.28.1

Results

The femur is referred to family Psittacidae on the basis of the long, straight shaft, with a pronounced deflection medially of the internal condyle. In caudal view, the medial profile thus created is distinctive. Proximally, the head is proportionately large, with a simple, shallow trochanter.

The tarsometatarsus may be referred to Psittacidae based on its highly distinctive morphology, being very short and flattened, with a splayed arrangement of trochleae. The remains of the diagnostic divided and posteriorly deflected lateral trochlea are apparent. Although not available for direct comparison with modern specimens, the tarsometatarsus is sufficiently consistent in size and preservation to be considered as associated with the femur.

In terms of morphology and proportions, the specimens compare extremely closely with smaller species in the genera *Aratinga* and *Pionus* (Figs. 1–2). However, due to the



Figure 1. Tortugas wreck tarsometatarsus (centre) compared with modern specimens of left, *Pionus menstruus* (S/1996.57.1) and right, *Aratinga wagleri* (BMNH S/2002.57.1). Composite image, scale in mm (Natural History Museum, Tring, with permission of Odyssey Marine Exploration Inc.)



Figure 2. Tortugas wreck femur (centre) compared with modern specimens of left, *Pionus menstruus* (S/1996.57.1) and right, *Aratinga wagleri* (BMNH S/2002.57.1). Composite image, scale in mm (Natural History Museum, Tring, with permission of Odyssey Marine Exploration Inc.)

incomplete preservation of the specimens and the extremely wide range of potential species present in the Caribbean, Central America and northern South America (including extinct taxa), precise identification is impossible. Consequently, we recommend identification as *Aratinga* / *Pionus*.

Discussion

Based on its location, dimensions and comparison of its artefacts to other Florida wrecks known to have been part of the 1622 Tierra Firme treasure fleet, the Tortugas wreck has been identified as a Portuguese-built and Spanish-operated merchant ship sailing in the fleet, most likely the 117-ton *El Buen Jesús y Nuestra Señora del Rosario* (Kingsley 2012).

The Spanish treasure fleet system was firmly established by the mid 1500s, with two key fleets dispatched annually from Spain to its New World colonies to collect rich cargos and return them to Spain. The fleets comprised merchant vessels, *naos*, accompanied by several large armed galleons for protection.

The 1622 Tierra Firme fleet sailed from Spain in early spring, bound for a traditional route including Cartagena, Colombia; Portobello, Panama; and the coast of Venezuela. Ships would load gold and silver from Peru, Ecuador, Venezuela and Colombia, but would also take aboard agricultural cargo. Having made the required circuit, the Tierra Firme fleet headed for Havana, Cuba, in July to rejoin the other treasure fleet, the Nueva España, and be refitted and provisioned before heading for Spain.

However, the fleets' rendezvous in Havana was delayed until late August, well into the Caribbean hurricane season. The Nueva España fleet sailed immediately, but the Tierra Firme ships did not depart until 4 September, some six weeks behind schedule. One day out, the fleet encountered a hurricane as it headed towards Florida. In the storm, several ships were lost, including three of the great treasure galleons, and the remainder of the fleet was scattered (Mathewson 1986: 22–24). Human casualties numbered over 500. Another casualty on one small merchant vessel appears to have been the small parrot, presumably confined below decks.

There are several possibilities for the presence of a parrot onboard ship. Firstly, parrots were hunted as food by 15th and 16th-century explorers; eating parrots was also common amongst native peoples of the South American and Caribbean regions visited by the Tierra Firme fleet (Boehrer 2004). However, consumption of parrots by Europeans frequently seems to have occurred when explorers were *in extremis* and was certainly not embraced in Europe, perhaps due to its perceived association with native cannibalistic habits (Boehrer 2004). For Europeans, parrots became principally valued as pets and curiosities, and were valuable in trade. The parrot of the Dry Tortugas wreck was therefore most likely either a pet of one of the passengers or crew, or was perhaps being shipped for sale in Spain.

Trade in parrots from the New World became established from the late 15th century, led by Spanish and Portuguese explorers and merchants. Transatlantic shipment of parrots to Spain for trading is recorded as early as 1494, when 60 'long-tailed parrots (macaws)' were brought from Hispaniola to Cadiz (George 1980: 80). By 1526, New World parrots were so familiar that Gonzalo Fernandez de Oviedo was able to remark in his *General and natural history of the Indies* that 'so many species have been carried to Spain, it is hardly worth while to take time to describe them here' (Boehrer 2004: 57). Exotic and expensive, parrots were commonly featured in paintings of the 1500s and 1600s, perhaps as inhabitants of paradise or as status symbols in portraits with their owners. A review of the art collections of the Museo del Prado, Madrid, reveals that macaws and amazons were the most frequently depicted during this time, with smaller parrots rarely shown (Gomez Cano *et al.* 2010).

Evidence of parrots from the art record appears somewhat overlooked, despite its potential significance in revealing early ornithological records in Europe. For example, a relatively well-known painting of a parrot by Herman Henstenburgh (1667–1726), believed to have been painted in Hoorn, Holland c.1680, was only recently formally identified by one of us (JHC) prior to its sale at the request of the vendor (Ongpin 2012). The painting depicts

a Sun Parakeet *Aratinga solstitialis*, a taxon that only appeared in formal ornithological literature from the 1730s, but was clearly known to merchants decades earlier. It is worth noting that in Amsterdam at about the time Henstenburgh illustrated the *Aratinga*, the cost of a parrot is recorded as 'roughly sixty guilders' (Margócsy 2010: 67), indicating the potential value of such species.

Information on trade in New World parrots seems more abundant in literature, though there is considerably more to be gleaned from historic art concerning contemporary knowledge of exotic species. An excellent insight into the late 17th-century parrot trade through the Caribbean, and also the many uses of parrots, is given by Sir Hans Sloane (1725) in his descriptions of the flora and fauna of Jamaica during his residency in 1687–88. Accurately identifying all seven parrot species recorded by Sloane is difficult due to his use of taxonomic names from contemporary literature that cannot be satisfactorily resolved or may be misapplied. English names are given to only a few species.

Sloane's list evidences trade between Caribbean islands and from further afield. A species identifiable as Cuban Parrot *Anaëza leucocephala* is said to be 'brought from Cuba to Jamaica frequently, and are found likewise in Hispaniola'. (In fact the Hispaniolan birds were almost certainly the closely related Hispaniolan Parrot *A. ventralis*.) Another species identifiable as the smallest of macaws, Red-shouldered Macaw *Diopsittacus nobilis*, is 'brought from the Spanish Main, or continent of America frequently hither'. Interestingly, transatlantic trade from Africa is also noted; birds identifiable as Grey Parrot *Psittacus erithacus* 'are brought to the Island of Jamaica in great Quantities from Guinea' (all Sloane 1725: 297).

Sloane also recorded that various species were kept as pets, and might be trained to speak; 'the Great Maccaw', clearly Blue-and-yellow Macaw *Ara ararauna* was, according to Sloane 'more Articulate than any Bird I ever heard' (Sloane 1725: 296). He also noted that native species were eaten as well; the 'common parrot of Jamaica' aka Yellow-billed Parrot *Amazona collaria* is recorded as being 'eaten bak'd in Pyes' and tasting of pigeon (Sloane 1725: 297). Another species called by Sloane 'the Small Maccaw' and described as being 'very common in the Woods' (Sloane 1725: 297) is not readily identifiable as the name given, '*Maracaua altera Brasiliensis*', cannot be reliably resolved (cf. Salvadori 1891). Whatever they were, they were 'eaten as Pigeons; but when young, ... tamed, and kept as Parrots' (Sloane 1725: 297).

Sloane's list is dominated by larger parrots, but one *Aratinga* is included, noted as being 'very common in the Island of Jamaica. And in Espanola.' (Sloane 1725: 297). Sloane did not provide a description, but his name is traceable as Peach-fronted Parakeet *A. aurea*, a small conure native to central and eastern South America, but not usually found in Central America or the Caribbean. It is possible this was another species in trade, but Sloane's conure may be one of the native Caribbean species such as Brown-throated Parakeet *A. pertinax*, the name being misapplied by Sloane due to similarities of his observed species with the descriptions given by the literature he was consulting.

Of particular significance to late 17th and early 18th-century ornithologists were the South American parrot descriptions of Georg Marcgraf (1610–44) from his explorations of Brazil in 1638, published posthumously in the *Historia naturalis Brasiliæ* (Piso & Marcgraf 1648). His descriptions were incorporated almost verbatim into the works of Francis Willughby (1635–72) and John Ray (1627–1705) (Willughby 1676, Ray 1713), and were cited subsequently by Sloane (1725). Drawing on both Marcgraf and Sloane, Linnaeus (1758) provided a useful benchmark of early–mid 17th-century scientific knowledge of small South American parrots. Recognised in the tenth edition of the *Systema naturae* were three conures now in *Aratinga* (four originally described, but two have been lumped subsequently)

and only one parrot now recognised in *Pionus* (Linnaeus 1758, Dickinson 2003). Notably, these species, i.e. *Aratinga pertinax pertinax*, *A. p. aeruginosus*, Orange-fronted Parakeet *A. canicularis*, *A. solstitialis* and Red-billed Parrot *Pionus sordidus*, are all from Central America, the southern Caribbean and northern South America, their distributions overlapping with the prime traditional trading areas for merchant and treasure fleets.

For the 1622 Tierra Firme Fleet, key stops would have been the historic Spanish ports of Portobello, Panama, and Cartagena, Colombia. The significant cargo of pearls recovered from the Tortugas wreck also connects the *El Buen Jesús y Nuestra Señora del Rosario* to the historic port of Nueva Cordoba, now Cumaná, on north-east Venezuela's pearl coast (Kinsley 2012). Any of these ports would have potentially offered opportunities to trade for a wide range of mainland parrot species, and it is entirely feasible that the small parrot of the Tortugas wreck was acquired during the ship's layover at one of these ports. Cuba itself may have offered further opportunities, including the native Cuban Parakeet *Aratinga euops*. Both *Aratinga* and *Pionus* species would have undoubtedly been good subjects for trade, making attractive and amenable pets (Low 1992).

Despite the abundance of macaws, amazons and other taxa in contemporary art, literature and other documentation, physical evidence of any parrot species in 16th and 17th-century Europe is almost non-existent. Only one European archaeological find appears to have been widely reported; remains of an undetermined medium-large species similar in size to *Psittacus erithacus* found amongst 17th-century rubbish in Norwich, England (Albarella *et al.* 1997: 51–52, Boehrer 2004, Serjeantson 2009: 333). In the UK, despite the unprecedented explosion of organised archaeological excavations since 1990 following revisions of planning law, no parrots have been reported in any subsequent faunal analyses. Where are they? Their abundance in art and literature strongly suggests that there should be an associated physical record. One strong possible reason for their absence is that they may be simply going unrecognised; a known problem for other archaeologically invisible taxa such as the important horse-donkey hybrid, mule (Johnstone 2004, 2010) or Common Pheasant *Phasianus colchicus*, which are also significantly under-reported (Poole 2010). Based on our experience, for parrots this is probably due to a combination of a lack of zooarchaeologists' familiarity with parrot remains, a lack of comparative specimens readily available in archaeological units or institutes where much initial analysis is conducted and, particularly in the case of developer-funded excavation projects, a lower prioritisation of comprehensive analysis of bird remains due to perceived lack of additional interpretative value and / or lack of commissioned time.

Conclusions

The remarkable discovery of the remains of an *Aratinga* / *Pionus* parrot on the wreck identified as the *El Buen Jesús y Nuestra Señora del Rosario* from the 1622 Tierra Firme fleet provides a unique insight into the previously largely invisible 17th-century trade and movement of smaller parrot species from the New World to Europe. It is physical evidence of colonial Spain's trading connections with the Caribbean and mainland South America, potentially adding valuable live exotic birds to the more famous precious cargos transported by the treasure fleets.

In terms of understanding contemporary ornithological knowledge, it appears to be the earliest record of a small South American parrot species in trade, representing a group of taxa largely overlooked in ornithological literature until the early to mid 1700s.

Given its context, recovered from a shipwreck at a depth of > 400 m, the Tortugas wreck parrot highlights the surprising paucity of European archaeological remains from terrestrial

sites. In the absence of physical remains, the historic fine art record provides an as yet under-used resource for recording the presence of exotic species in Europe.

However, discovery of further archaeological remains in Europe would shed valuable light on the timing of discovery and arrival of parrot species in Europe, prior to the compilation of more comprehensive scientific literature. Additionally, new finds would add to our understanding of early trade in parrots and perhaps other exotic birds, not only from the New World, but potentially also from other major trading destinations across Africa, Asia and, in particular, Indonesia. We hope that the recovery of the ill-fated parrot from the Dry Tortugas wreck will encourage new vigilance amongst zooarchaeological researchers and lead to further finds of historic parrots.

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- Addresses: Joanne H. Cooper, Bird Group, Dept. of Life Science, Natural History Museum, Tring, Herts. HP23 6AP, UK, e-mail: jhc@nhm.ac.uk. Philip L. Armitage, Curator, Brixham Heritage Museum, Brixham, Devon TQ5 8LZ, UK, e-mail: mail@brixhamheritage.org.uk